

GRAND CENTRAL TERMINAL

New York City

Transportation

THE NEW YORK CENTRAL SYSTEM



Center of Manhattan:
Crossroads of America:
Gateway to a Continent:

Grand Central

By A. C. Kalmbach

TO MILLIONS of Americans who have never seen New York City, Grand Central Terminal is the embodiment of all the glitter and bustle that is Manhattan. To New Yorkers it is a utility; yet it is their very own railroad station, the one terminal on Manhattan which has grown up with the island. It is to New York the symbol of the far-flung New York Central System.

Seen from 42nd Street, the terminal is likely to be a disappointment to the bumpkin who gazes upon it for the first time. True, it looks just like the pictures. But it is dwarfed by skyscraper hotels and office buildings, and its magnificent show does not become really apparent until one gets inside. Then comes the first breathless view of the beautiful concourse and a gasp of amazement at the crowds coming and going, not via 42nd Street after all, but through numerous subterranean passages connecting with subways, hotels, and office buildings.

Most of these people give hardly a glance at the massive square columns, the perfectly proportioned vaulted ceiling, or the sunlight streaming down from the high south windows. They are on their way, in a railroad

station, and all the architecture, all the impressiveness, are but an incident to the engineering marvel that is the real Grand Central, an engineering marvel mostly beneath ground and out of sight of all but the most inquiring passengers.

The real Grand Central is the layout of 67 stub tracks, the loops for turning trains, the storage tracks, and the throat tracks over which flows a traffic which ranks Grand Central with Pennsylvania Station in New York, South Station in Boston, Union Station in St. Louis, and Waterloo Station in London as the busiest in the world. It is over these tracks that trains of the New York Central and New Haven railroads in the peak year of 1946 handled 65,156,063 passengers, long-distance and suburban, without straining the facilities engineered back in the early years of the century. In 1902, when Grand Central Terminal was being conceived, the passengers in old Grand Central Station, used by the same two roads, totaled 15,557,421. In the new terminal 252,288 passengers have been handled in a single day, on July 3rd 1947. The terminal was indeed planned for the future, and on a titanic scale.

That so much railroad capacity could be crowded into one stub-end station as com-

pact as Grand Central is a credit to William J. Wilgus, onetime chief engineer of the New York Central, who developed the unprecedented plan of building the train shed in two layers. This was made possible only by using electricity for traction power, an innovation which up to that time had been tried for steam railroads only on the B&O's Baltimore tunnels and one or two relatively small projects.

Perhaps 59 platform tracks could be concentrated on a single level behind one headhouse. But even were a concourse of this length practical, Grand Central rests upon some of the most valuable real estate in the world, about 48 acres of it! As it is, the concourse, one of the most beautiful rooms in the world, is also one of the largest, 272 feet long, 125 feet high, and 120 feet wide. The old New York city hall could be placed within it without crowding. And in spite of all this stupendous length, passengers may find themselves arriving far to the west of the concourse, beneath the Biltmore Hotel, or leaving far to the east under the Commodore.

THE terminal itself is a city in miniature, housing within its walls a motion picture theater, an art gallery, several restaurants, and numerous shops in which may be purchased most of the staple necessities of life and many of the luxuries. Some of the larger hotels, such as the Commodore,

Radio version.

"Grand Central Station" it is in the radio script, although Grand Central Terminal is obviously the purported scene of this popular program. But any Grand Central habitué would be very, very surprised to hear a steam locomotive pull up to one of the arrival platforms, whistle tooting and steam working right up to the last turn of the drivers! Naturally the radio sound effects have to be more in accord with the average man's idea of a railroad station than with the real, rather tame, sounds of electrified Grand Central.

Biltmore, and Roosevelt, have direct entrance into the terminal so that travelers may go from the trains to their hotel quarters without passing through the streets, a convenience much appreciated on stormy days.

The main station building faces south on 42nd Street, one of the wide, important cross-town streets of Manhattan, and is 722 feet long, 395 feet wide and 165 feet high at the street level. Below the street level it is 745 feet long and 550 feet wide. The floor space of the station can accommodate 30,000 people in the concourses and waiting rooms.

The tracks run north from the terminal under one of the finest New York streets, Park Avenue, and leave the island at its

The center of Grand Central.

Grand Central as an operating unit centers not about the concourse, nor the ticket windows, nor the information booth, but about this diagram and desk in Tower A. This is the train director's desk from which he controls all operations on the upper level. The director does not actually move the levers which work the switches and signals, but at his desk figures out the movements needed and then passes the directions on to levermen who set up the routes through the maze of switches. Tower A handles most through trains. Tower B, directly beneath the lower level, handles commuter trains.





Most beautiful room in the world.

The concourse of Grand Central Terminal, New York Central and New Haven station in New York City, is generally rated as one of the most beautiful rooms in the world, and train travelers will no doubt give it the exclusive title. New York Central ticket windows are at the left in the photo and another similar row of windows for New Haven tickets is out of the photo to the left. The entrances to train platforms are out of the photo to the right. Beneath this main concourse is the suburban concourse, about the same size but with a low ceiling.

north end. While the terminal building looks small, it is eight stories high, but behind a façade designed to look like a single floor. Three huge, beautifully proportioned windows take up most of the south front. Lower Park Avenue from the south comes to an abrupt stop immediately under the center window, but its traffic is carried over 42nd Street on a bridge and then splits, skirting two sides of the terminal on elevated roadways which then tunnel through the 35-story New York Central Building and emerge at street level, at 46th Street, to become *the Park Avenue*.

It is below this striking Park Avenue, below the 35-story New York Central skyscraper, below other important buildings, a church, hotels, and clubs, that the railroad is built, a bewildering array of tracks and switches laid in a cavern carved from rock and roofed with steel and concrete. Four tracks come down the tunnel under Park Avenue, and at 57th Street start to fan into the wide, gloomy spaces filled with red and yellow signal lights, gleaming rails, and rugged columns. The tracks spread not only east and west, but downward. Three inclines, of 2.7 and 3.0 per cent grades, carry four tracks into real depths of the lower level.

The upper track level is for through trains. The entrance to its platforms is directly from the main concourse. But beneath this main concourse is another of about the same size, but with a low ceiling. This is for suburban passengers, and along its north wall are the entrances to the low-level suburban platforms. Thus the two types of traffic are separated, and the station area is used most efficiently.

The upper level has, of course, its large waiting room, nearly the size of the concourse. And the lower level has its restaurant and lunchroom with the famous oyster bar. Both have the necessary ticket windows, divided into groups for the New York Central and the New Haven. Both levels have baggage and parcel checking facilities and both have information booths in the centers of their concourses. Twenty-two newsstands are strategically located to enable the quick purchase of magazines or newspapers. In addition, there are six bootblack stands, six cigar stores, two barber shops, a ladies' hair-dressing parlor, a theater ticket booth, a liquor store, two book shops, two drug stores,

Some highlights about Grand Central Terminal.

Construction of the present Grand Central Terminal, which succeeded the old Grand Central Station, on the same site, was begun in 1903. Electric operation supplanted steam operation February 13, 1907, and the Terminal was completed February 2, 1913.

The Terminal, one of the busiest in the world, has 67 tracks, with 41 on its upper level and 26 on the lower level. The upper track level is for through trains and the lower level is used mostly for suburban trains.

The main station building, facing south on 42nd Street, at street level is 722 feet long, 395 feet wide and 160 feet high. Below the street level it is 745 feet long and 550 feet wide. Its floor space can accommodate 30,000 people in its concourses and waiting rooms.

With its subsidiaries, the Terminal covers 48 acres, northward from 42nd Street. It is owned by the New York Central Railroad Company.

About 510 trains enter or leave the Terminal daily.

In 1946, the Terminal handled an all-time record of 65,156,063 passengers.

It has its own medical department and police force and houses a motion picture theater, an art gallery, several restaurants and numerous shops.

Two-hundred eighty-five Red Caps or porters are employed in the Terminal.

a print shop, a clothes-weaving shop, a haberdashery shop, a jewelry shop, a cutlery shop, a candy shop, and many others.

With all these conveniences and with the direct entrances to three neighboring hotels, it is possible to live in Grand Central Terminal and its adjacent building for almost any period of time without suffering the loss of any of the conveniences possessed by persons who utilize the whole city's resources.

Though the tracks of the upper level are 20 feet below street level and the suburban tracks are 24 feet farther down, no one need use stairs to reach the various levels. An ingenious system of ramps at comfortable slopes connects the street level, subway entrances, waiting room, concourse, and the platforms. The platforms themselves are at car-floor level, four feet above the railhead. Until the time Grand Central was built, this type of platform had been almost universal



Centraliana.

Although dwarfed by its surroundings, the terminal building is very large. Around it goes the upper level of Park Avenue (called Fourth Avenue south of 31st Street), while northward the avenue is built directly above the tracks (far right). This picture was taken looking north from windows in New York Central Building, showing the Waldorf-Astoria Hotel on right. The scene below was taken from almost the present location of Waldorf-Astoria just after the old terminal had been partially electrified. Steam locomotives were still in use. Upper right, the old station as it looked in the 1870's when three separate waiting rooms for the Hudson River, the Harlem and the New Haven railroads were maintained. At left, center, is close-up of Transportation group statue on facade of terminal.



in England but very little used in this country except for rapid transit service. Pennsylvania Station in New York was built about the same time and also with high platforms. In both cases they aid in faster car loading.

In addition to the platform tracks the station layout includes stub storage tracks, so that the upper level has a total of 41 tracks and the lower level 26 tracks. As originally designed, the station layout included somewhat fewer platform tracks, and, because of shorter platforms, much additional storage capacity out beyond the sloping lead tracks over which trains ran to the platform tracks. But the trains grew longer and longer and the platforms were lengthened out into what had at first been storage space.

For the most part, the westernmost tracks on each level are used for arriving trains.





THE GRAND CENTRAL DEPOT, NEW YORK.

New York Central & Hudson River, "New York & Harlem" and the New York & New Haven Railroad Companies. Completed in 1913.

On each level are loops of track running from these westernmost arrival tracks around the south end of the terminal and back into the parallel trackage at the east side of the layout. Thus arriving trains can be turned directly and pulled away to the coach yards, or, in the case of the multiple-unit suburban trains, given a quick cleaning and run right out again on the suburban departure tracks at the east side of the loop.

These loops are a unique feature of the terminal design. South Station at Boston had loop tracks for suburban trains provided in its design, but these were never put in operation. The Hudson & Manhattan tube terminal is a loop layout, as is also the San Francisco Bay Bridge terminal, but both these are rapid transit types of railroad. The suburban level loops in Grand Central well proved their worth in the summer of 1919 when a subway strike diverted a huge and sudden traffic to NYC local trains. In one day more than 181,000 passengers were moved, and most of them were utterly unaccustomed to using railroad suburban service, thus adding to the congestion. Extra trains were run around the loops in almost rapid transit fashion and the crowd was moved with an average train delay of only a fraction over two minutes. But the loop for the turning of through trains was even more of a departure, so much so, in fact, that it was not completed and put into operation until May 21, 1927, 14 years after the terminal's opening.

An integral part of the operating scheme of any great terminal is its coach yard, where cars are serviced, cleaned, and made up into trains. For Grand Central this coach yard is at Mott Haven, five miles north of the terminal at the point where the main line

and the Harlem Division divide. When Grand Central was built sufficient station storage facilities were provided to concentrate most multiple-unit, or suburban, car servicing and switching in the terminal itself, where such cars are stored on the lower level. Through trains, however, are taken to Mott Haven where a commissary is located and their cars are cleaned, serviced with linen, ice and food and can be given light repairs, when necessary.

In between Mott Haven and Grand Central is a four-track stretch of line which ranks as one of the busiest four-track roads in the world. Over it run all New York Central and most New Haven trains into and out from the city, as well as all empty train movements to and from Mott Haven yards. These empty train movements amount to about 20 per cent of regular trains. During the one hour between 5 and 6 in the afternoon, 56 regularly scheduled trains go in and out of the terminal. At this time three of the four tracks are devoted to handling the outbound traffic, while between 8 and 9 in the morning three tracks are given over to inbound traffic. This is made possible by a modern signaling system which permits any of the four tracks to be used in either direction. The signal blocks are short, but the signals give four-block indications and thus trains can run on close headway with perfect safety.

A modern electric interlocking, Tower MO, controls the intricate trackage at Mott Haven. Not only do the main lines diverge here, but there is a wye track, and across this wye and into the crotch of the mainline junction run the lead tracks for Mott Haven coach yard. Tower MO can so align the switches as to put incoming trains onto any



Emerging from tunnel at 96th Street.

At 96th Street the railroad goes underground beneath fashionable Park Avenue. Below: Electric locomotives operating passenger trains between Grand Central and Harmon, N. Y., are of several subclasses, but this one is most frequently used on the through trains. Built by General Electric and Alca, these 146-ton, 600-volt locomotives are powered by eight GE-91-A motors, having a one-hour blown rating of 2488 horsepower; tractive effort at 25 per cent adhesion, 73,150 pounds; maximum speed, 70 miles per hour.

one of the four throat tracks leading down the crucial five miles to Grand Central, and it can take trains for any one of these tracks and place them on the correct outgoing mainline tracks. A full set of cross-overs at 106th Street, where Tower NK spans all four tracks, also allows changing trains from track to track, and likewise the tower at the terminal throat, 57th Street, has full flexibility. These towers are all interconnected by a loud-speaking telephone system, so that with efficient informality and yet with absolute safety trains can be routed around each other to make full use of every section of track.

Inside the terminal area itself, pinned down by giant supporting girders of the Waldorf-Astoria, is a four-story signal tower with two operating levels, one for the through-train track level and one for the suburban level. One would hardly call this a tower, and yet tower it is, underground but sticking up through the two layers of trackage and carrying all the usual railroad signaling paraphernalia, relay rooms, power supply, track diaphragms, and the long rows of interlocked levers to control switches and signals. Here is the real heart of Grand Central. In Tower A, upper level, five men are constantly at work setting up routes through the rows of switches for the arriving and departing through trains. Tower B, below, does the same thing for suburban trains. The tower

director must be ever on the alert for deviations from regular schedule. If all trains ran the same number of cars day after day and came on time, schedules could be worked out for lining up the tracks. But a train may one day have extra cars or extra sections and so not fit its customary berth. Then the tower director must hurriedly work out a means of placing it as close to its usual platform as practical. Or a train may arrive late and crowd upon the time of another train customarily assigned to the same track. All these problems are figured out anew every few minutes down there under the Waldorf-Astoria in Towers A and B. Back in the heart of the station building itself, in a room which might pass for an office and quite out of sight of trains and track, is another unusual signaling "tower" controlling the loop tracks.

The signal units themselves are of the searchlight type, and at the usual block signals along the main line between the terminal and Mott Haven two units are used, one above the other, to give the indications for four blocks ahead. At interlockings three units are used on each mast. With signals for both directions on all four tracks, the red, green, and yellow lights present a very colorful spectacle at night to the rider on the rear end of a train.

The electrical power for train operation is distributed by means of an under-running



third rail, protected by wood on top for the safety of employees. Power is 600 volts direct current. A higher voltage on overhead trolley was not used both because of limited clearances in the tunnels and because of New York ordinances prohibiting high-voltage overhead conductors. The New Haven differed with the New York Central on choice of power and distribution method for its mainline electrification and chose 11,000-volt alternating current with overhead trolley. In order to bring New Haven locomotives and multiple-unit cars into the terminal from Wakefield, where the New Haven joins the NYC's Harlem Division, the New Haven electric equipment was fitted with third-rail shoes and with control equipment to permit use of either type of current. It is interesting to note that the New Haven later gained entrance to the Pennsylvania Station via Hell Gate Bridge and for many years used the same dual-power arrangement there, with over- instead of under-running third rail. But when the huge Pennsylvania mainline electrification was pushed to completion the Pennsy became another advocate of high-voltage A.C. power, and now New Haven trains use 11,000 volts straight through on the Hell Gate Bridge route but change power when running to Grand Central.

THE Grand Central Terminal is not only a remarkable transportation instrument, but the center of a great civic development. The air rights over the railroad tracks and yards were used beyond all precedent, and the income from these air-rights leases goes far toward paying the fixed charges on the terminal. At the same time this development has helped to increase the importance of the terminal from the transportation standpoint, for, more and more, Grand Central becomes the hub of an extremely important section of New York City.

This was not so back in 1869, when Commodore Cornelius Vanderbilt chose the site for the first Grand Central "depot." Then 42nd Street was far uptown. But it was one of the wide crosstown streets in the city plan, and the commodore, with his usual prescience, foresaw the day when New York would cover the whole of Manhattan Island and 42nd Street would be at the commercial center of gravity. Indeed, the commodore's very choice of location did much to bring

this about. Perhaps, had that original Grand Central been located elsewhere, Times Square, only a few blocks west on 42nd Street, would not today be so important.

The first Grand Central was a wonder of its day. Commodore Vanderbilt had just consolidated the New York Central with his Hudson River Railroad. He also owned the New York & Harlem, over which the New Haven entered New York City. None of these roads had terminals worthy of the metropolis. The Harlem and the New Haven shared a building down at 26th Street which later became the first Madison Square Garden. The Hudson River used a small-town depot down at Chambers Street and West Broadway. The Harlem Road had the better entrance to Manhattan, coming as it did down the length of the island parallel to Fifth and Madison avenues, which already had social prestige. So the commodore chose the location at 42nd Street on the Harlem line, built a connection between the Hudson River Road and the Harlem at Spuyten Duyvil, and when his magnificent new station was completed shifted all Hudson River trains, except a local connection, to the Harlem line. The old Hudson River Railroad entrance to New York, which has had no passenger service since World War I, is now the West Side freight line.

The new station, said the commodore, must be something pretentious, something worthy of New York's then 1,500,000 population. It was. The structure was designed by Isaac C. Buckout, superintendent and chief engineer of the New York & Harlem, a man who had designed many a smaller structure on the Vanderbilt railroad lines. Grand Central Depot, opened in 1871, was his masterpiece. The huge train shed covered certainly the largest room in America and perhaps in the world, 600 feet long and 200 feet wide. Into this train shed came none of the smoke of locomotives, for Mr. Buckout had devised an ingenious system whereby the locomotives of incoming trains speeded up a distance before they reached the station switches and, after a running uncoupling, ran ahead of the trains and were switched off. The trains, under control of a brakeman, then coasted into the train shed. This system was used for many years with no mishaps.

Around the south and west sides of the train shed was built the station building it-



self. Unfortunately, this was divided into three separate sections, one for the New Haven along the 42nd Street front and two for the Harlem and for the Hudson River roads along the west front, on a new street which later was named Vanderbilt Avenue. Although the New Haven had the best frontage, the structure, like its successors, was owned and operated by the New York Central with the New Haven leasing rights to the station and its approaches.

The separation into three sections was one disadvantage the first Grand Central never overcame. But in spite of this the building was widely acclaimed and, in fact, Edward Hungerford is authority for the statement that it was held second only to the Capitol at Washington in national esteem. By modern-day architectural standards the building might be described as rambling and gingerbreaded, but by the standards of 1871, when it was opened, it was handsome with its red brick walls, its exterior trim of cast iron painted white to look like marble, and its slate roof.

The giant train shed was a special source of wonder. The station master's office had a

bay window high in the station wall at the south end of the shed, from which the station master could watch the comings and goings of his trains. An ingenious, for its time, system of electric bells gave warning when trains crossed the Harlem River five miles to the north. The running time from there to Grand Central was 20 minutes, supposedly time enough for the station master to clear the arrival track. Only passengers with tickets were admitted to the train shed, an arrangement new to the country.

As the years came and went the Grand Central Depot took its place as a fixture of the city. It came also to take more and more of the ever-growing suburban and through traffic built up between the expanding reaches of the New York Central System and the developing midtown New York. An annex was built along the east edge of the property, but it was not enough. Came 1898, and with the turn of the century the old depot was rebuilt and considerably enlarged. The three separate stations in one building were finally combined into one large workable terminal, with common waiting room and ticket facilities.

Mott Haven is part of the terminal.

Originally Grand Central Terminal was laid out to provide for turning trains and car storage on the spot, but traffic increased so astoundingly fast that the tracks in the terminal building were relocated for longer trains. Now storage, and much of the train turning, is handled at Mott Haven Yard, located in the Bronx north of Harlem River (left). Servicing approximately 800 cars daily, the yard contains 23 miles of track and a capacity to handle 771 cars. The view of the coach yards is toward Manhattan, while the scene at right is of MO Tower in the wye at the south end where the yards, the NYC main line and the Harlem Division all came together.



BUT even the remodeled depot was only a stopgap. Its huge waiting room and train shed were not enough for twentieth century New York. The big decision was made in 1902, the decision to build a modern terminal big enough and fine enough to serve New York in every way for many years to come and to fittingly represent the New York Central in its biggest city.

The work of demolishing the old Grand Central Depot began July 1, 1903, and on August 26 excavation started along the east edge of the property at Lexington Avenue, where some old buildings had been torn down. Generally speaking, construction work progressed from east to west across the site, with trains continuing to use the old depot until June 5, 1910, by which time the lower level of the new terminal and a partly completed upper level were taking care of the business. The big job was the blasting and removal of more than three million cubic yards of rock, most of which was carried out along the main line and used to widen the grade, particularly along the Hudson River.

At no time was service interrupted. The engineers figured so as always to have sufficient tracks in operation in either the old or new stations to take care of not only the regular business but the seasonal rushes as well. At the same time, electric operation was being established on the approaches and in the old station so that all service could be turned over to white coal by February 13, 1907. The only steam locomotives used in Grand Central after that date were those which pulled the cars of rock out from under the steam-shovel dippers.

The giant train shed that had been the commodore's pride and joy disappeared. The deep hole for the new tracks was at its eastern edge. Trains were running under it. But the contractors built a giant traveler

which they moved on tracks along the length of the shed, removing the steel work bit by bit while the traffic proceeded underneath.

When New York first saw Grand Central Terminal in its full massiveness and beauty there were many who believed, and said so frankly, that it had been constructed on a scale far too large for the traffic it handled. And they were right. But it was built not for 1913 alone (it was opened February 2, 1913), but for years to come, years like 1945, with almost triple the traffic of 1913. The public now needs no convincing as to the foresight and vision of the men who sponsored Grand Central. Today it is acknowledged to be one of the most efficient and most beautiful terminals in the world.

Intermingled in the steady stream of humanity which flows through the terminal day and night are travelers of every age and rank, from every country and every continent. "Stand there long enough and you are almost sure to meet everybody you know." The terminal is a cross-section of humanity; its magnificent precincts are the stage on which are enacted every day most of the comedies and tragedies of human life. Here is a happy group going home for New Year's; there, a honeymoon party is followed through the gates by a bereaved family taking a loved one to his last rest in his distant birthplace. In another part of the station a group of convicted criminals, most of them young, is entraining, under guard, for Ossining, there to pay in Sing Sing prison the penalty that society demands for their misdeeds. And so it goes, a kaleidoscopic, never-ending, ever-changing drama, with a sentimental, emotional, imaginative appeal that fascinates.

To take care of the thousands of travelers in and out of Grand Central Terminal, particularly on the long-distance trains, requires the services of 285 Red Caps, as the porters

are called. These porters do not select their own posts, but are divided into groups, performing different tasks according to their age and service. The newest men remain on the lower level two weeks before being graduated to through trains. The older men meet the taxis at Vanderbilt Avenue and 42nd Street and the trained younger men service the through trains, as this job requires swift, alert service.

Each morning, just before the arrival of the *Twentieth Century Limited* or the *Commodore Vanderbilt*, both from Chicago, 30 to 50 porters line up inside the train gate under the eye of the chief of the Red Caps. Just before the train arrives they run down the platform and station themselves in groups at the door of each passenger car.

The average Red Cap is 35, although some are as old as 67. Under their skillful eyes there is seldom lost even a single piece of anyone's baggage.

One of the most used services in the terminal is found in the two parcel rooms, one on the upper level and one on the lower level, where 40 men employed in eight-hour shifts keep travelers' belongings stored, but instantly available. There are also 2,546 parcel checking lockers distributed throughout the Terminal. Morning commuters deposit clothing until it is time to dress for the theater, perhaps in the dressing rooms which are provided at nominal rentals in the lower level. Occasionally, absent-minded people never return for their parcels. These are held for many months and every effort is made to find the rightful owners. Sometimes traveling men quit their jobs suddenly and let their bosses worry about the sample cases they have checked in the parcel rooms. This happens more often

than one might expect, and when it does, every effort is made by the parcel-room forces to locate the manufacturer and return the sample case. The parcel rooms even receive laundry, returning it washed and ironed in 24 hours, a service frequently used by commuters.

The most modern and efficient system so far devised for receiving and answering questions over the telephone was placed in operation April 1, 1937, in the Information Bureau of Grand Central Terminal, when an entirely new installation of telephone apparatus was completed after five months' work. This bureau, one of the busiest in the world, has answered as many as 17,000 queries in one day. This task required the services of 41 operators.

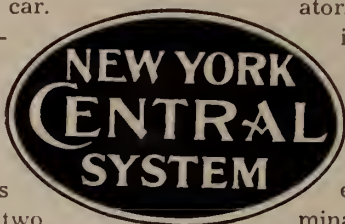
On this record day the maximum was 2000 calls an hour, or

33 a minute. Normally, it is about half this number. The bureau works through a new order turret system, the first ever installed in a railroad terminal.

Its operation is largely

automatic, the information clerks receiving the calls without having to take time to throw keys as heretofore. One of its features is that if all the receiving operators are busy answering questions, the excess incoming calls are stored electrically in the order received and then answered in turn as fast as a clear wire becomes available.

Over the main entrance of the terminal may be seen these words: "To those who with head, heart and hand toiled in the construction of this monument to the public service, this is inscribed." In front of the center window on the south façade is a bronze statue of Commodore Vanderbilt, gazing down lower Park Avenue, his back solidly against a greater Grand Central than even he envisioned.



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